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硕士学位论文

土耳其与中国的双边贸易及经济增长

THE BILATERAL TRADE WITH CHINA AND TURKEY ECONOMIC GROWTH

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摘要

本文研究了中国与土耳其之间的双边贸易关系以及土耳其的经济增长。土耳其是个外贸型经济国家，因此本文包含了对额外的贸易变量的论述，即在对外贸易中出口额与进口额之间的差额。本文分析了所有系列的单位根检验，并在第一时间证明了它们的完整性。随后，我对向量误差修正模型进行了预估判断。利用向量误差修正模型是因为协整关系的存在。然而，在土耳其的 GDP 增长以及土耳其与中国的双边贸易之间并未发现格兰杰因果检验。因果关系检验的结果显示了 GDP 与对外贸易之间的双向因果关系。

关键词：土耳其经济；与中国的双边贸易；土耳其经济增长；

Abstract

I investigate the relationship between bilateral trade between China and Turkey and Turkey's economic growth. Since Turkey is a trade-based economy, I have included an additional trade variable, which is the difference between the value of exports to the rest of the world and imports from the rest of the world. I have conducted unit root test for all series and have proved them to be integrated at first order. I then estimate a VECM model. The VECM model is used because of the presence of a cointegrating relationship. However, no Granger causal relationship is found between Turkey's GDP growth and bilateral trade with China. The result of the causality test does indicate bi-directional causality between GDP and trade with the rest of the world.

Keywords: Turkey economy; bilateral trade with China; Turkey economic growth;

Contents

Chapter 1 Introduction

The Ottoman Empire, the former Turkish state, collapsed during the First World War, when the allies, victorious, occupied its regions. Ataturk, supported by some of his colleagues, initiated the Turkish War of Independence. As a result of this act, in 1923, the Republic of Turkey was born on the arches of the Ottoman Empire. Turkey is located partly on the Anatolia in the Western Asia and partly on the East Thrace in Southeastern Europe. It shares borders with eight countries: Armenia, Azerbaijan, Bulgaria, Greece, Georgia, Iran, Syria, and Iraq. At its birth, Turkey had an undeveloped economy with a weak industrial sector, an agricultural sector using old techniques, and a poor-quality livestock industry. However, Turkey is now one of the newest industrialized countries, according to the Central Intelligence Agency (CIA), and an emerging market, according to the International Monetary Fund (IMF). It is one of the world's leaders in the export of agriculturally based products, textiles, ships, and transportation equipment. In consequence, it enjoys good trade relations with a wide range of countries, such as China, Germany, France, Russia, the US, and the UK, to name a few.

In this time of globalization, a country's global network has taken on a different meaning, serving as a representation of how reliable, important, or prosperous a nation is or will be in the near future. The Chinese economy is an obvious example of current and potential economic growth. Its list of trading partners is ever-growing, as is the Chinese network. Most nations having something to offer, and in order to expand their global networks or partnerships, they rely on international relations. International relations can facilitate solutions for most countries, since they intensify relationships among nations at many levels. However, international relations is also a key term that refers to political, governmental, and trade relationships among countries. In the present work, I focus on the trade aspect of international relations: namely, international trade.

Most nations have realized their inability to exist in an autarky, or self-sufficient state. Therefore, they engage more often in trade with other nations. International trade is the result of the exchange of goods and services among nations that would otherwise be inaccessible. This allows nations to expand their markets beyond natural boundaries. Countries can then enjoy increased welfare by exposing their populations to foreign product and services from the international market. The international market contains a wide variety of goods, such as oil, gas,

wine, water, clothes, jewelry and more. In addition to traded products, there are also many traded services, such as transportation, tourism, and technology exchange.

The unequal distribution of primary natural resources and the differences in factors of endowment, such as capital, technology, and labor, are the main reasons behind the need for international trade. The existence of the global market allows countries to sell the goods and services that they produced most efficiently at a competitive price by exporting; in exchange, they buy those products that they do not produce efficiently by importing. This is the benefit of comparative advantage. For example, the US, a capital-abundant economy, tends to produce capital-based product. Meanwhile, China, which is efficient in producing solar panels, may export these panels to the EU area (which is less efficient in such production) and import wine from the EU. Along the same lines, Turkey, an agriculturally based economy, exports textiles and import such products as machinery, metal and chemistry from China, the US, Germany and other countries.

China, the world's second-fastest-growing economy, has a significant impact on its surrounding economies. In this work, I investigate the impact of the bilateral trade relationship between Turkey and China on Turkey's economic growth. Turkey and China have a long relationship history. They began interacting during the historical Silk Road business, which started in China. During the period from BC 206 to AD 220, a commercial agreement was signed between Kao-Tsu, the Chinese emperor, and Mete Khan, the Turkish leader. This contributed to the creation of a free trade and marketplace. As stipulated by this accord, China provided silk and food-related goods to the Turks.

However, the first official trading act between modern Turkey and China was signed in 1976, a few years later after Turkey recognized of the People's Republic of China in 1971. With this act of recognition, Ankara officially ceased treating Taiwan as a separate nation from China.

In 2001, China became a member of the World Trade Organization (WTO). This change played a significant role in the removal of quotas and other restrictive measures that had been imposed on China up to that point. It also had a negative impact on the Turkey-China relationship. Despite the intensification of trade between Turkey and China, the absence of export quotas and the reduction of import tariffs affected the value of goods traded. Turkey lost its monopoly position, and China emerged as a threat to Turkey.

According to Turkey's foreign trade data from 2009, China was the 20th largest trade

partner in terms of Turkish exports, but the 3rd largest in terms of Turkish imports. In 2010, Wen Jiabao, the Chinese Prime Minister, officially travelled to Turkey. His visit had the objective of fostering the Turkey-China economic relationship. In pursuit of this goal, he signed eight agreements in the areas of trade and transportation. According to their current strategic relationship, Turkey exports to China ceramic, glass, plastering products, machinery appliances, and food products, such as dried fruit, tobacco, and meat, and it imports from China furniture, organic chemical, electrical machinery, equipment, clothes, and more.

In this work, I focus on the bilateral trade between Turkey and China and its impact on Turkey's economy growth. This paper will be organized as follows: Chapter 2 will present a review of the important academic work on bilateral trade and economic growth. This will allow me to put in perspective a list of important variables for the study of the bilateral trade and economic growth in Turkey. In Chapter 3, I will describe the Vector Auto Regression (VAR) model to be used in this work and briefly discuss the required data formats and their sources. In Chapter 4, I implement the model for the case study and interpret the results. In Chapter 5, I summarize the work and draw important conclusions.

Chapter 2 Literature Review

In the early years of the Republic of Turkey, Turkey was not able to produce enough food to meet its internal demands. From 1923 to 1983, Turkey adopted a statist approach, in which the government planned the budget and imposed limitations on certain sectors, such as foreign direct investment, flow of currency, trade, and participation of the private sector. This centralized system was fixed and quite limited. Therefore, in 1983, Turgut Ozal initiated a series of reforms, causing the country to begin the shift from a fixed system to a market-based one. These reforms, combined with significant foreign loans, allowed Turkey to open up its market and implement flexible pricing systems. However, despite the positive effects of the reforms, the Turkish economy still faced certain problems, such as corruption, high inflation, a weak financial system, and a public sector deficit. There was need for fiscal reform; thus, the financial prime minister, Kemal Dervis, responded with a reform structure. This reform solved most of the existing problems and increased the confidence of foreign investors.

Today, Turkey is a major international trader. It is one of the founders of the Organization for Economic Co-operation and Development (OECD) and the G-20 major economies, and it was ranked the world's fastest growing economy between 2002 and 2007. Turkey's economic growth is heavily supported by trade. Thus, I wish to know how Turkey's trade with China has contributed to this growth.

The relationship between trade and economic growth is one of the most recurrent topics in economics. However, a clear answer has yet to be found. The different economic structures of countries and their trade relationships make it difficult to determine a clear link between trade and growth based on the theoretical growth model. According to Romer (1990) and Rivera-Batiz and Romer (1991), trade distortions have an impact on a country's growth rate. Trade can either increase or decrease the growth rate, based on the endogenous growth model theory. This theory sees growth as a result of actions on internal forces, such as investing in innovation and human capital. However, it is important to note the difference between trade openness and trade policies, since these two faces of trade tend to affect growth differently. The trade policy of an economy is a summary of how the local government regularizes the foreign trade market, and openness of trade defines the level at which the local government is ready to engage in trade

with a partner. It is difficult to compare the results obtained from studies concerning these areas of trade and their impacts on economic growth.

The study by Lucas (1988) and Romer (1986) on the endogenous growth model presented a different view of the possible source of economic growth. Barro (1990) formally demonstrated the importance of public infrastructure in economic growth. Along the same lines, Aghion and Howitt (1992) presented the importance of innovation in economic growth and Romer (1990), Grossman and Helpman (1991) did the same for new knowledge. The endogenous growth model advocates the increasing returns of economies of scale; thus, it does not allow convergence. The important factors of growth can be summarized as follows.

First, the research and development (R&D) conducted by Fagerberg (1987) and Ulku (2004) has proved influential. After performing various empirical studies, these authors confirmed the existence of a strong relationship between R&D and economic growth, on one hand, and between innovation and economic growth, on the other. The argument is that the results of R&D and innovation have the effect of boosting economic growth by introducing new and efficient methods of production. Current R&D can be observed through many variables, including scientific journals, international patent applications, the number of students enrolled in doctorate programs, and adherence to quality standards of the International Organization for Standardization (ISO).

Second, investment is an influential variable of growth. In the endogenous growth model, investment is said to have a permanent impact; however, in the neoclassical model, investment is argued to have only a temporal effect. These theoretical views have generated considerable empirical research, such as studies by Mankiw, Romer, and Weil (1992); De Long and Summers (1991); and Levine and Renelt (1992); however, none of these have found a concrete relationship between investment and economic growth.

Third, in addition to investment, human capital is considered to be an important factor in growth. Human capital is an influential factor in both the endogenous and the neoclassical growth models. Human capital refers to the acquisition of skills through training and/or education. A person's education level and number of years of education are the most-used proxies to measure human capital, as can be seen in many works in which education is used (e.g., in the important determinant of economic growth work by Hanushek and Kimko (2000) and Barro and Sala-i-Martin (1995)). When capturing educational or human capital, it is

common to look at such variables as literacy and enrollment in primary, secondary and tertiary level for both genders. However, some academics, such as Topel (1999) and Pritchett (2001), are not convinced of the relevance of education as an important factor of economic growth.

Fourth, macroeconomic variables and economic policies have been recurrently used in the literature (e.g., the work by Barro (1990) and Fisher (1993)) as determinants of economic growth. It can be easily demonstrated that economic policies have either a direct or an indirect impact on economic growth. Economic policy decisions have an important impact on economies through, for example, political and legal institutions or investment in the infrastructures of education (i.e., human capital) and transportation. These variables are, in turn, likely to influence economic growth. Fisher (1993) proved that macroeconomic variables are necessary, but not sufficient to explain growth. The most-used variables are inflation, budget deficits, tax and fiscal policy, GDP, government budget, productivity, and interest rate.

Fifth, the empirical work of Borensztein, De Gregorio and Lee (1998) and of Lensink and Morrissey (2006) revealed the existence of a relationship between foreign direct investment (FDI) and the economic growth. This relationship has been shown in many versions of the endogenous growth model. The effect of FDI is increasing with the effects of globalization and the creation of an international market. In the scope of this work, I will consider the FDI and, particularly, the FDI from China as control variables.

Sixth, the international market is the result of trade openness. Trade openness is also frequently used in the literature as a major determinant of growth. In theory, openness allows exposure and increased competition among local firms as the result of transfers of technology and knowledge. It allows economies to trade those goods and services in which they have comparative advantage. In studies conducted by Dollar (1992) and Edwards (1998), it is found that economies with high capital flows that are significantly open to trade have high growth rates and high GDPs per capita. However, Vamvakidis (2002) and Levine and Renelt (1992) questioned the robustness of these conclusions on the basis of their methodology. In this study, to measure openness, I consider the GDP, tariff, tax and subsidies as variables.

The concluding factor in growth is the institutional framework, which is revealed by Rodrik (2000) to have a significant impact on the growth rate. Rodrik (2000) enumerates five of the most influential institutional variables with direct and indirect impacts on growth: “property rights, regulatory institutions, institutions for macroeconomic stabilization, institutions for social

insurance and institutions of conflict management". Along the same lines, Easterly (2001) concluded that strong institutional structures are needed to allow traditional growth factors to impact the economic growth

This section has described the variables of different aspects of the economy that I will consider while investigating the impact of the trade with China on Turkey's economic growth. These variables will prove useful and will provide reliable information if the right model is used before the interpretation of the results. In the next section, I will explore different models used in the literature. Then, I will choose a model and justify my choice, as well as discuss the data format I will use for this case study.

Chapter 3 Methodology and Data

To study the potential impact of Turkey's bilateral trade with China on Turkey's economy, I will use the vector autoregressive (VAR) model. Numerous economics studies focus on the causality among variables, and these all use the VAR model to explore this relationship. The VAR model is a flexible and successful model for dealing with multivariate time series. It is also an extension of the univariate autoregressive model. The VAR model has evolved to become a standard tool for use in investigating relations between variables and their inter-dependencies in economy and finance. The VAR is used mostly for models with endogenous variables. In this case, information is extracted from past values.

I study of the impact of the trade with China on Turkey's growth using the following tools: the unit root test, the cointegration examination, and the causal effect and its direction.

3.a The Unit Root Test

Before I dive into the study of the relationship between the bilateral trade and the economic growth of Turkey, it is important to ensure that the series under consideration is stationary. There are two stationary states: First, there is the strict stationary state, which requires the probability distribution of the series to be stable, despite changes in time or space. The values of the first and second moment and other moments of the probability distribution are constants under the strict stationary definition. The second type is the weak stationary process, which requires only the first and second moment of the distribution to be constant. The weak stationary state is implied by the strict stationary state, but the reciprocal does not hold true. When dealing with time series, we require them to meet at least the second type of stationarity. In other words, the series must have a constant mean and variance.

To test for stationarity, many unit root tests are available: the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test, the Dickey-Fuller test, and the Augmented Dickey Fuller test. These tests are integrated into most econometrics software programs.

The underlying procedure of Augmented Dickey-Fuller (1979) test is obtained by the following regression:

$$\Delta Y_t = \alpha + \beta t + \delta Y_{t-1} + \varphi_i \sum_{i=1}^{m} \Delta Y_{t-i} + \varepsilon_t$$

Where Δ is the difference operator; β , δ and φ are the coefficients to be estimated; Y is the variable whose time series properties are examined; and ε is the white-noise error term. The significance of the coefficient is then tested. The process is integrated if at least the coefficient of the first difference is significant. When dealing with integrated processes, the next step is to study the cointegration or long-run relationship.

3.b Cointegration

By definition, cointegration is the share of stochastic drift of two or more series. Integrated series of the same level may be cointegrated (or, in other words, may have a long-term relationship). In studying cointegration, I intend to use the Johansen method. The Johansen method has two options: the Eigen value and the trace. This method is commonly applied to integrated series of the first order. The Johansen method determines the number of cointegrating relations and attempts to estimate the relationship between the series. It is also the maximum likelihood estimator. A regression is the starting point of the test and it follows the equation below.

$$\Delta Y_t = C + \sum^{K} \Gamma_i \Delta Y_{t-1} + \Pi Y_{t-1} + \varepsilon_t$$

Y is the dependant variable

K is the number of independent variables

ε_t is the random error

The number of cointegrating relations is related to the rank of the Π matrix, *r*.
There are three case scenarios:

1- If r<n, this indicates the presence of r cointegrating relationships.
2- If r=n, this indicates that Π has full rank, and Y is stationary.

3- If the rank $LR = -N \sum_{i=r\neq 1}^{k} \log(1-\gamma_i)$ for r=0,1,2,...,,K-1=0, then the matrix Π is null.

A likelihood ration (LR) test is used to identify the specific number of relations, which is determined in a sequential way.

If the rank r=0, then the null hypothesis H_0: r=0 is tested against H_1: r>0. The null is rejected if the LR test statistic is greater than the critical value. In this case, the hypotheses are adjusted with an increment of 1. Thus, the test proceeds as follows: The null hypothesis H_0: r=1 is tested against H_1: r>1. This process continues until we fail to reject the null hypothesis. The LR test statistic is defined as follows:

$$LR = -N \sum_{i=r\neq 1}^{k} \log(1-\gamma_i) \quad \text{for r=0,1,2,...,,K-1}$$

Where N is the number of observations

γ_i : The eigenvalue of matrix $\prod$

K: number of variables

r: rank of matrix $\prod$

3.c The Granger Causality Test

Before studying the impact of bilateral trade on economic growth, I will study the direction of causality between GDP growth (G) and Turkey's trade balance with China (TC). This will be accomplished through the Granger causality test. In the absence of cointegration, the standard VAR model is estimated using first differences to investigate Granger causality. However, in the presence of cointegration, I use the VEC model, which estimates both long-run and short-run relationships between the variables.

In the absence of cointegration, the model is as follows.